

REMARKS

Very thanks for Examination's suggestion and thanks for finding some citations about the present invention, thereby, the applicant may know more information about the invention. This case has been carefully reviewed and analyzed in view of the office action. All details of the reference prior arts are fully considered and compared with the present invention.

ABOUT THE REJECTION SPECIFICATION

Responsive to the objections and rejections made of the Examiner in office action. We have amended the specification, claims and abstracts. All the errors disclosed in that office action has been corrected according to the Examiner's indications disclosed in the official action.

ABOUT CLAIM REJECTION OF 35USC103

Indeed the citations disclose some features of the present invention, and the applicant agrees with these viewpoints, however applicant discovers that some main features of the present invention are not disclosed in the citation which can form the novelty and inventive step of the present invention.

To illustrate the novelty of the present invention and overcome the objection from the citations, the applicant decides to Claims 1 to 6, without prejudice or disclaimer of the subject matter thereof, and add new claim 7. The added new claim 7 is based on the original specification and the features in Fig. 2 of the present invention. The relation of the new claims with respect to the original claims are shown in the following.

CLAIMS SHOW CHANGES AND NUMERALS FOR DISCUSSING IN THE REMARK

Claim 7. (New) A test strip adapted to receive a liquid test sample and insertable in a meter for enabling the received liquid test sample to be analyzed by the meter, the test strip comprising:

a substrate 1; the substrate 1 being a narrow elongated strip, and

a circuit pattern formed in the substrate 1; wherein when a liquid test sample is dropped to the circuit pattern 2 in the substrate 1, the substrate 1 is inserted into a meter, enabling the meter to examine the concentration of a particular substance in the applied liquid test sample;

the circuit pattern being formed of bio-carbon, and directly printed on the substrate 1, the circuit pattern comprising a first circuit 21 and a second circuit 22; the first circuit 21 and the second circuit 22 having a front and a second probe end 211, 221, respectively, a first and a second rear contact end 213, 223, respectively, and a first and a second elongated transmission section 212, 222, respectively connected between the respective front probe end 211, 221 and the respective rear contact end 213, 223; the first and second circuits 21 and 22 are so arranged that a test sample accumulation space 23 is formed in the substrate 1 between the front probe ends 211 and 221 of the first and second circuits 21, 22 and adapted to receive the liquid test sample to be examined;

the first rear contact end 213 being an enlarged area having a width wider than that of the first elongated transmission section 212;

the second front probe end 211 being an enlarged rectangular area; three sides of the enlarged rectangular area being enclosed by the first front probe end 221;

the second rear contact ends 213 having two pines which are connected to the second elongated transmission section 222; and

an auxiliary rear contact 24 being formed on the substrate 1 and being arranged between the two pines of the second rear contact end 213;

the substrate 1 having a protruding guide portion 11 corresponding to the test sample accumulation space 23 for guiding the applied liquid test sample into the test sample accumulation space 23, wherein when the applied liquid test sample is guided to the test sample accumulation space 23, the front probe ends 211 and 221 of the first and second circuits 21, 22 being induced to produce a reacted signal; the transmission sections 212 and 222 of the first and second circuits 21 and 22 transmit reacted signal from the front probe ends 211 and 221 to the rear contact ends 213 and 223 and then to respective contacts in the meter in which the test strip is inserted.

DISCUSSION ABOUT THE NOVELTY THE PRESENT INVENTION

(A) The claim 7 defines a structure illustrated in Fig. 2 of the present invention.

(1) The first feature of the present invention is that:

“the second front probe end 211 being an enlarged rectangular area; three sides of the enlarged rectangular area being enclosed by the first front probe end 221;”

This feature can be seen in Fig. 2 of the present invention. It is illustrated that the second front probe end 211 is enclosed by the first front probe end 221. However, this feature is not seen in the citations USP2004/0158137 and USP2002/0099308. The feature of the present invention is that the test sample accumulation space 23 connected the first front probe end 211 and

the second front probe end 221 is longer than those illustrated in Fig. 1 of the present invention and longer than those illustrated in the two citations USP2004/0158137 and USP2002/0099308. Thus it has a sufficient test sample accumulation space 23 to accumulate test sample so as to generate a great reacted signal.

(2) The second feature of the present invention is that:

“the second rear contact ends 213 having two pines which are connected to the second elongated transmission section 222”

This feature is illustrated in Fig. 2 of the present invention, where it is illustrated that the end 213 has two pins so that the second circuit 22 has sufficient contact areas to contact the meter for measuring. However, the two pin design of the second circuit 22 makes the signal has two points to flow to the meters and thus the signal is larger. Thereby if one pin is lost, another pin can be used to provide the signal to the meter contacting the second circuit 22.

However, the citations can not achieve above mentioned effect.

(3) The third feature of the present invention is that:

“an auxiliary rear contact 24 being formed on the substrate 1 and being arranged between the two pines of the second rear contact end 213; ”

In the present invention, the auxiliary rear contact 24 is arranged between two pins of the second rear contact end 213.

Although the citation USP2004/0158137 discloses an auxiliary contact 29 (see 1 of the citation), but it is between the first front probe end and second front probe end. Thus the position of the auxiliary contact 29 is not like that of the present invention. Advantage of the auxiliary contact 24 of the present invention is for enabling the test strip to fit different contact positions in different models of meters. However, the design of the citation ‘137 has different usage as compared with the present invention.

Thus the design of the citation '137 can not be used to that the present invention.

(4) For the combinations of the citations

From above discussion, it is known that the combination of all the citations cannot have the features in above mentioned (1) to (3).

Although other features can be seen in the other citations, from the office action, it is known that the present invention combines the features in various citation so as to form a powerful combining device, which cannot be achieved by any of the citations. Although the citations USP2004/0158137 and USP2002/0099308 have similar usage as the present invention, but they cannot achieve the same effect of the present invention. The present invention combine many features so as to provide a power device. This makes the present invention being novel.

(5) RESULT

Since in above discussion, it is apparent that no prior art has the features of the present invention, especially in new claim 7. Furthermore, as we know that no other prior art has features of the present invention. Thus, the present invention is novel and inventive.

If there is any error in the specification, or claims, applicant requests and authorizes Examiner to amend the claims, specification and drawings of the present invention so that they can match the requirement of U. S. Patent. Attentions of Examiner to this matter are greatly appreciated.

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectively requested.

Respectfully submitted.

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"MARK-UP" COPY OF THE AMENDED SPECIFICATION

TEST STRIP FOR EXAMINATION LIQUID TEST SAMPLE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to test strips for medical examination use and, more particularly, to ~~such a test strip for picking, which picks up a~~ the liquid test sample to be examined from one lateral side conveniently for accurate examination.

2. Description of the Related Art

A variety of test strips have been disclosed for use with different meters for ~~examining examination~~ the ~~concentrations concentration~~ of different substances in the urine, blood, or serum. During examination, the liquid test sample (urine, blood, or serum) is applied to the test strip, and then the test strip is inserted into ~~a~~ the respective meter for analysis. Subject to the test sample application methods, regular test strips are divided into two types. According to the first type, the examiner needs to use a pipette or the like to pick up the test sample and then to drop the test sample to the test sample receiving area of the test strip from the top side. According to the second type, the examiner needs to use a puncher to punch a hole in the patient's thumb, for enabling the blood to flow out of the hole, and then the examiner has to attach the sideway entrance of the test strip to the hole in the patient's thumb to pick up the blood from the patient and to guide the blood to the test area in the test strip. The former type needs a pipette or the like to apply the test sample to the test strip. The latter enables the examiner to directly pick up the test sample from the punched area in the patient's thumb. However, if the examiner has no punch means to punch a hole in the

patient's thumb for collecting the desired blood sample, the examination cannot be proceeded.

SUMMARY OF THE INVENTION

The present invention has been accomplished under the circumstances in view. It is the main object of the present invention to provide a test strip, which eliminates the aforesaid drawbacks. It is another object of the present invention to provide a test strip, which enables the examiner to pick up the test sample directly from the patient through a direct contact, or through a pipette or the like by dropping.

According to one aspect of the present invention, the test strip comprises a narrow elongated strip of a substrate insertable in a liquid test sample examining meter and adapted to carry the liquid test sample to be examined, and a bio-carbon circuit pattern printed on the substrate. The circuit pattern comprises a first circuit and a second circuit adapted to contact the liquid test sample ~~been~~ applied to the substrate, to produce a reacted signal upon contacting contact with the applied liquid test sample, and to transmit the reacted signal to the liquid test sample examining meter in which the test strip is inserted. According to another aspect of the present invention, the substrate has a test sample accumulation space adapted to accumulate the applied liquid test sample, and a protruding guide portion adapted to pick up the liquid test sample and to guide the applied liquid test sample to the probe ends of the first and second circuits.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front plain view of a test strip according to a first embodiment of the present invention.

FIG. 2 is a front plain view of a test strip according to a second embodiment of the present invention.

FIG. 3 is a front plain view of a test strip according to a third embodiment of the present invention.

FIG. 4 is a front plain view of a test strip according to a fourth embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG.1, a test strip in accordance with the present invention is shown comprised of a narrow elongated strip of a substrate 1, and a circuit pattern 2 formed in the substrate 1. When a liquid test sample (blood, serum, etc.) is dropped to the circuit pattern 2 in the substrate 1 from the top side or guided to the circuit pattern 2 from one lateral side of the substrate 1, the substrate 1 is inserted into a meter (not shown), enabling the meter to examine the concentration of a particular substance in the applied liquid test sample.

The circuit pattern 2 is formed of bio-carbon, i. e. carbon containing a biological agent, in this case an enzyme, and directly printed on the substrate 1, comprising a first circuit 21 and a second circuit 22. The first circuit 21 and the second circuit 22 each have a front probe end 211 or 221, a rear contact end 213 or 223, and an elongated transmission section 212 or 222 connected between the front probe end 211 or 221 and the rear contact end 213 or 223. The first and second circuits 21 and 22 are so arranged that a test sample accumulation space 23 is formed in the substrate 1 between the front probe ends 211 and 221 of the circuits 21 and 22 and adapted to receive the liquid test sample to be examined. Further, the substrate 1-2 has a protruding guide portion 11 corresponding to the test sample accumulation space 23 for guiding the applied liquid test sample into the test sample accumulation space 23. When the applied liquid test sample is guided to the test sample accumulation space 23, the front probe ends 211 and 221 of the circuits 21 and 22 are induced to produce a reacted signal. The transmission

sections 212 and 222 of the circuits 21 and 22 transmit the reacted signal from the front probe ends 211 and 221 to the rear contact ends 213 and 223 and then to respective contacts in the meter in which the test strip is inserted.

Referring to FIG. 1 again, when the applied liquid test sample is guided to the test sample accumulation space 23, the applied liquid test sample immediately touches the front probe ends 211 and 221 of the circuits 21 and 22 and mixed with the enzyme in the test strip, thereby producing a reacted signal. When the user inserts inserted the test strip in the meter, the transmission sections 212 and 222 of the circuits 21 and 22 immediately transmit the reacted signal to the internal circuit of the meter through the rear contact ends 213 and 223, enabling the meter to analyze the concentration of the assigned substance in the applied liquid test sample.

FIG. 2 shows an alternate form of the test strip according to the present invention. This embodiment is similar to the aforesaid first embodiment with the exception of the design of the second circuit 22. According to this embodiment, the second circuit 22 has its front probe end 221 extending transversely forwards and spaced from the bottom side of the front probe end 211 of the first circuit 21 at a distance, and then extending longitudinally upwards and spaced from the left side of the front probe end 211 of the first circuit 21 at a distance. Further, the second circuit 22 has a plurality of auxiliary rear contacts 24 respectively extended from the transmission section 22 for enabling the test strip to fit different contact positions in different models of meters. The details of the circuit in Fig. 2 is defined below. The first rear contact end 213 being an enlarged area having a width wider than that of the first elongated transmission section 212. The second front probe end 211 is an enlarged rectangular area; three sides of the enlarged rectangular area being enclosed by the first front probe end 221. The second rear contact ends 213 have two pines which are

connected to the second elongated transmission section 222; and an auxiliary rear contact 24 is formed on the substrate 1 and is arranged between the two pines of the second rear contact end 213;

FIGS. 3 and 4 show still another two alternate forms of the test strip. These two embodiments are similar to the embodiments shown in FIGS. 1 and 2 respectively, however these two embodiments eliminate the aforesaid protruding guide portion 11 from the substrate 2.

A prototype of test strip for examining liquid test sample has been constructed with the features of FIGS. 1.about.4. The test strip for examining liquid test sample functions smoothly to provide all of the features discussed earlier.

Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

Abstract

A test strip includes ~~is constructed to include~~ a substrate and a bio-carbon circuit pattern formed of two circuits and printed on the substrate, the circuits each having a front probe end spaced from each other by a test sample accumulation space in the substrate and adapted to contact the liquid test sample being dropped from the top side or guided from one lateral side of the substrate and to produce a reacted signal after contact of the liquid test sample with an enzyme on the test strip, and then to transmit the reacted signal to the meter in which the test strip is inserted after contact of the front probe ends of the circuits with the applied liquid test sample.